Remarks and Arguments

Claims 23, 24, 34, and 35 are canceled without prejudice or disclaimer. Accordingly, claims 17-20, 22, 25-33, and 36 are pending. Claims 17, 25 and 28 were amended to a method of classifying monoclonal antibodies that are raised against a single antigen. Support is found at paragraph [0004], line 3. Step (c) was amended to recite that exposing each treated biosensor surface to a mAb. Support is found at paragraph [0007], line 5. New step (e) was added to clarify that steps (c) and step (d) are repeated for each mAb tested. Support is found at paragraphs [0049] and [0058]. Former step (e), now (f), is amended to recite that mAbs that exhibit similar binding profiles to the same treated sensor surfaces are classified into the same functional group. Support for this amendment is found at paragraph [0020]. No new matter is added by the amendments, and the Examiner is respectfully requested to enter them.

The Examiner's comments are addressed in the order made.

I. Claim Objections

Claim 17 was objected to for recitation of the phrase "to a each mAb" in step (c). In response, claim 17 has been amended to recite exposing each treated biosensor surface to a mAb. This amendment is made to more clearly define the metes and bounds of the claimed invention in which each mAb raised against the same antigen is tested for its ability to bind two or more biosensor surfaces, each of which biosensor surface is covered with an immobilized antigen which is modified with a different agent. Accordingly, it is believed that this amendment provides an appropriate correction and thus the objection may now be withdrawn.

II. Rejections Under the Second Paragraph of § 112.

A. Claim 17 was held to be indefinite for reciting "sibling monoclonal antibodies." The rejection is rendered moot by the above amendment removing the term "sibling," and reciting that the monoclonal antibodies are raised against a single antigen. It is believed that this rejection may now be withdrawn.

B. Claims 23 and 34 were held to be indefinite for reciting the phrase "the agent is an enzyme and a chemical agent." The rejection is rendered moot by cancellation of the claims.

C. Claims 17, 25, and 28 were rejected for lack of antecedent basis for the term "the antigen." Applicants have amended the claims to include antecedent basis. The rejection may now be withdrawn.

III. Rejection Under 35 USC § 103(a).

A. Claims 17-19, 23-26, 28-32, and 34-35 were rejected as obvious over Colyer et al. (WO 00/50902) in view of Fagerstam et al. (Journal of Molecular Recognition, 1990, 3(5/6):208-214). This rejection is respectfully traversed.

Obviousness is a legal conclusion based on underlying facts of four general types: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) any objective indicia of nonobviousness. See Graham v. John Deere Co., 383 U.S. 1, 17-18, 15 L. Ed. 2d 545, 86 S. Ct. 684 (1966); Continental Can Co. USA, Inc. v. Monsanto Co., 948 F.2d 1264, 1270, 20 USPQ2d 1746, 1750-51 (Fed. Cir. 1991); Panduit Corp. v. Dennison Mfg. Co., 810 F.2d 1561, 1566-68, 1 USPQ2d 1593, 1594 (Fed. Cir. 1987).

Colyer et al. describes a high throughput assay for analyzing a test sample which may contain an agent capable of modifying an immobilized polypeptide. The method described by Colyer et al. has the following steps: immobilizing a polypeptide to a physical support; contacting the immobilized polypeptide with a test sample which may contain an agent capable of modifying the immobilized polypeptide; contacting the immobilized polypeptide with a binding partner polypeptide, wherein the binding of this partner polypeptide to the immobilized polypeptide is at least partly dependent on the modification state of the immobilized polypeptide; and measuring the association of the binding partner polypeptide to the immobilized polypeptide.

Colyer et al. does not disclose or suggest (1) a method of classifying mAbs; (2) a method of grouping or distinguishing between mAbs raised against a single antigen; (3) a method which requires determination of binding profiles. In contrast, the present method utilizes biosensor surfaces with the same antigen modified by different agents, and tests each mAb against each surface to determine its binding profile, and thus allow mAbs with similar profiles to be grouped and distinguished from mAbs to the same antigen with different binding profiles. The above claims are modified to clarify that each mAb is tested against each modified antigen, generate an overall profile for each mAb, and then are able to group similar mAbs into groups based on their functional binding profile.

Fagerstam et al.. Fagerstam et al. describes a method for testing the ability of several mAbs raised against the same antigen to bind an antigen which has already one antibody bound. In other words, the method of Fagerstam et al. is a method of identifying the epitopes bound by a group of mAbs. Fagerstam et el. discloses a two-site binding assay in which a first

mAb from unprocessed hybridoma culture supernatants is immobilized on a surface; the antigen p24 is then introduced, followed by the introduction of a second mAb in undiluted hybridoma supernatant. The ability of the second mAb to bind to the antigen is tested. This method groups mAbs by the epitope recognized.

Fagerstram does not disclose or suggest (1) immobilizing an antigen onto at least two biosensor surfaces; (2) treating each biosensor surface with a different modifying agent; (3) classifying mAbs into groups on the basis of their binding profile for the same antigen differently modified.

The analysis under § 103(a). Applicants respectfully submit that the cited prior art references, either taken together or alone, do not render the claimed invention obvious.

Neither reference discloses or suggests a method according to the pending claims, that is, classifying mAbs raised against the same antigen into similar groups based on their ability to bind an antigen modified in different ways.

Applicants submit that Fagerstam et al. is not properly combined with Colyer et al. because Fagerstam is directed to a method for identifying epitopes bound by mAbs raised against an antigen. The method of Fagerstam et al. relies on the presence of unmodified epitope domains, and thus would not function for epitope binding if the antigen were modified after it is immobilized. Accordingly, combining Colyer et al. with Fagerstam et al. would destroy the purpose of the Fagerstam et al. invention and further, would not achieve the instant invention to group mAbs into classes according to their binding to modified antigen.

Accordingly, in light of the above remarks, it is respectfully requested that this rejection be withdrawn.

B. Claims 20 and 33 were rejected as obvious over Colyer et al. (WO 00/50902) in view of Fagerstam et al. (Journal of Molecular Recognition, 1990, 3(5/6):208-214), and further in view of Lin et al (Journal of Food Science, 1976, 41(5):1056-1060). This rejection is respectfully traversed.

Lin et al. Lin et al. discloses chemical modification of a collagen membrane by glutaraldehyde to cross-link the collagen membrane in order to determine the effect of the chemical modification on the enzyme-binding capacity of the collagen membrane.

Lin et al. does not disclose or suggest a method of classifying monoclonal antibodies that are raised against a common antigen that includes (1) immobilizing an antigen onto at least two biosensor surfaces, (2) employing the effect of chemical modification of antigen on the binding between antigen and its monoclonal antibodies, (3) determining the binding profile of

mAbs to a modified form of its antigen, or (4) classifying the mAbs into functional groups based on the binding profile of the mAbs to the modified antigens.

Analysis under § 103(a). The above remarks are fully applicable to this rejection and are herein incorporated by reference. Applicants submit that the combined references do not teach or suggest the pending claims. Nothing in the cited references yields a method which allows mAbs to the same antigen to be grouped on the basis of their binding profiles to at least two modified versions of the same antigen. Further, the Examiner has not indicated where in the cited references a suggestion or motivation can be found to combine the cited references in the particular manner of the present claims. Accordingly, in light of the above remarks, it is respectfully requested that this rejection be withdrawn.

C. Claims 22, 27, and 36 were rejected as obvious over Colyer et al. (WO 00/50902) in view of Fagerstam et al. (Journal of Molecular Recognition, 1990, 3(5/6):208-214) as applied to claims 17 and 30 above, and further in view of Otterness et al. (US 6,030,792). This rejection is respectfully traversed.

Otterness et al. (US 6,030,792). Otterness et al. discloses discloses four channels of a BIAcore sensor, in order to couple a different protein to each of the channels and characterized binding of a monoclonal antibody to four different types of proteins.

Otterness et al. does not disclose, teach, or suggest a method of classifying monoclonal antibodies that are raised against a common antigen that includes (1) immobilizing an antigen onto at least two biosensor surfaces, (2) employing the effect of chemical modification of antigen on the binding between antigen and its monoclonal antibodies, (3) determining the binding profile of mAbs to a modified form of its antigen, or (4) classifying the mAbs into functional groups based on the binding profile of the mAbs to the modified antigens.

Applicants respectfully disagree with the Examiner that the cited references, alone or in combination, render the rejected claims obvious. The Examiner is respectfully referred to the arguments made above regarding claims 17, 25, and 30. Applicants submit that claims 22, 27, and 36 are patentable for the same reasons that claims 17, 25, and 30 are patentable over the cited references. Accordingly, in light of the above remarks, it is respectfully requested that this rejection be withdrawn.

Conclusion

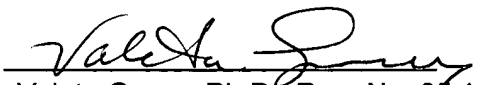
It is believed that this document is fully responsive to the matters raised in the Office action dated 15 March 2005. In light of the above amendments and remarks, it is believed that

the claims are now in condition for allowance, and such action is respectfully urged.

Fees

Applicants contend that no fee is necessary in connection with the filing of this response. However, if any fee is deemed to be necessary, authorization is hereby given to charge the amount of any such fee to Deposit Account No. 18-0650.

Respectfully submitted,



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